Claims

1. Apparatus for providing optical radiation, which apparatus comprises an optical fibre having core, a first cladding and a second cladding, in which the first cladding has a substantially constant diameter in its cross-section.

2. Apparatus according to claim 1 in which the first cladding is non-circular.

3. Apparatus according to claim 1 or claim 2 in which the first cladding has at least one axis of mirror symmetry.

4. Apparatus according to any one of the preceding claims in which the first cladding has a geometric centre.

5. Apparatus according to claim 4 in which the core is located at the geometric centre.

6. Apparatus according to claim 4 in which the core is offset from the geometric centre.

7. Apparatus according to any one of claims 1 to 3 in which the core is centred at the centre of the smallest imaginary circle that can contain the first cladding.

8. Apparatus according to any one of claims 1 to 3 in which the core is offset from the centre of the largest imaginary circle that can be contained within the first cladding.

9. Apparatus according to any one of the preceding claims in which the first cladding comprise circular arcs having centres at the vertices of an equilateral star.

10. Apparatus according to claim 9 wherein the circular arcs each have a first radius equal to the length of the side of the star.

11. Apparatus according to claim 9 in which the circular arcs each have a first radius greater than the length of the side of the star, which circular arcs are joined by circular arcs having a centre located at the vertices, and a second radius equal to the difference between the first radius and the length of the side of the star.

12. Apparatus according to any one of claims 9 to 11 in which each line of the star crosses all the other lines of the star.

13. Apparatus according to claim 12 in which the star is an equiangular star.

14. Apparatus according to claim 12 in which the star contains at least two different angles.

15. Apparatus according to any one of claims 9 to 14 in which the star contains an odd number of vertices.

16. Apparatus according to any one of the preceding claims in which the fibre contains at least one longitudinally extended hole.

17. Apparatus according to claim 16 in which the hole is circular.

18. Apparatus according to claim 16 in which the hole is non-circular.

19. Apparatus according to any one of the preceding claims in which the fibre contains at least one region of low refractive index.

20. Apparatus according to claim 19 in which the region of low refractive index is circular.

21. Apparatus according to claim 19 in which the region of low refractive index is non-circular.

22. Apparatus according to any one of the preceding claims wherein the fibre comprises rare-earth dopant.

23. Apparatus according to claim 22 in which the rare earth doping is selected from the group comprising Ytterbium, Erbium, Neodymium, Praseodymium, Thulium, Samarium, Holmium and Dysprosium, Erbium codoped with Ytterbium, or Neodymium codoped with Ytterbium.

24. Apparatus according to any one of the preceding claims and comprising a pump source for providing pump radiation coupled to the first cladding.

25. Apparatus according to any one of the preceding claims which apparatus is in the form of a laser, an amplifier, a source of amplified spontaneous emission, or a master oscillator power amplifier.